

AMENDMENTS TO THE DRAWINGS:

Figure 3 has been amended to change the numeric identifier for the line card from 210 to 120.

REMARKS

The application has been amended and is believed to be in condition for allowance.

Figure 3 has been amended to change the numeric identifier for the line card from 210 to 120.

Claim 25 is new and is based on the disclosure discussed below.

All claims were rejected under §112, first and second paragraphs.

More specifically, the Official Action stated that the terms "transmission destination area" and "transmission source area" were not defined. The Official Action stated that "[s]ince the terms have no plain meaning and the specification merely recites the same language of the claim, it is impossible to determine what constitutes the claimed unit."

From this, the Official Action concluded that the claimed subject matter was not described in the specification in such a way as to enable one skilled in the art to make and/or use the invention.

The Official Action also concluded that the claims were indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Applicants respectfully disagree.

§112, first paragraph requires "[t]he specification

shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, ..., to make and use the same, ...". As the Official Action correctly notes, §112, second paragraph, requires the claims to claim "the subject matter which the applicant regards as his invention".

These statutory requirements have been satisfied by the present application.

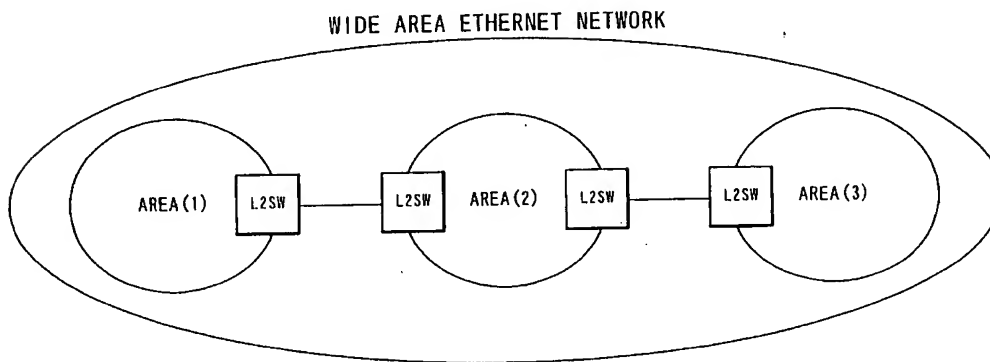
As disclosed a "transmission source area" is a first area network of a wide area network from which a frame is transmitted, and a "transmission destination area" is a second area network of the wide area network to which a frame is transmitted.

Note the statute directs that the specification be drafted for one skilled in the art. From the present application, one of skill would understand that a "transmission source area" is a first area network of a wide area network from which a frame is transmitted, and a "transmission destination area" is a second area network of the wide area network to which a frame is transmitted.

The application discloses that the present invention relates to a layer 2 switch (L2SW) which terminates a layer 2 frame (an Ethernet frame) and, more particularly, to improvement in a method of processing an expansion VLAN tag applied to a

frame for expansion (specification page 1, Field of the Invention). As is known in the art, expansion VLAN technique was developed for employing VLAN techniques used in a conventional L2SW to individually separate users in a wide area Ethernet for the use as VPN.

FIG. 8 (PRIOR ART)

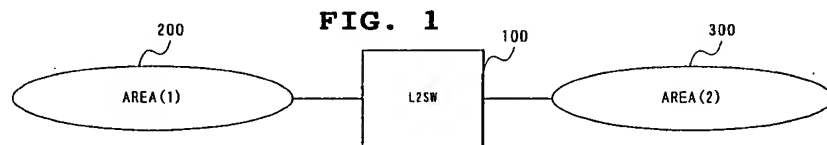


As shown in Figure 8, in one prior art method, the entire network is structured to have Ethernet networks each set up in each area connected with each other through an L2SW. Each area is an independent LAN in which as many as 4096 VLANs can be set. In this method, when transmitting and receiving data to bridge the areas, one deletes an expansion VLAN tag at an exit of each area and adds, at an entrance of a next area, an expansion VLAN tag inherent to that area.

Reference is made to specification page 6 which begins the DESCRIPTION OF THE PREFERRED EMBODIMENT section. Consistent with §112, first paragraph, the preferred embodiment of the

present invention is disclosed in detail with specific details set forth in order to provide a thorough understanding of the present invention; however, well-known structures are not shown in detail in order to unnecessarily obscure the present invention.

Figure 1 shows an L2SW 100 mounted with an expansion VLAN tag swapping function as a first embodiment of the present invention.



The present L2SW 100 mounted with the expansion VLAN tag swapping function accommodates a plurality of Ethernet lines to one-to-one connect an area (1) 200 network and an area (2) 300 in a wide area Ethernet network.

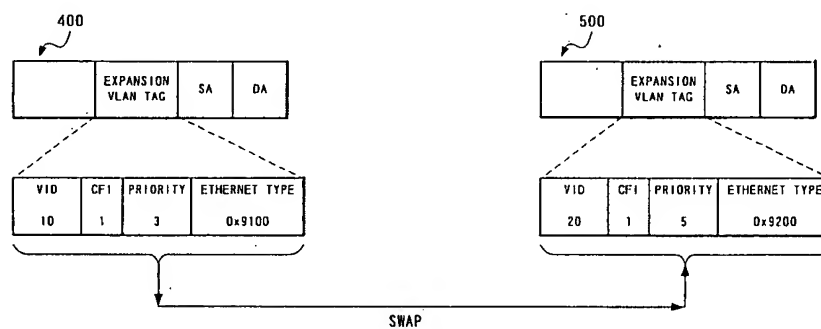


Figure 1 shows how an expansion VLAN tag in a frame 400, when the frame 400 is received from the area (1) 200 (a

transmission source area) is rewritten and transmitted toward the area (2) 300 (a transmission destination area). The frame 400 received from the transmission source area (1) 200 has its header information analyzed inside the device of the L2SW 100 to obtain transmission destination line information (about to which line of which line card the frame is to be output) and then the frame is transferred to the relevant line.

Figure 2 shows a block diagram showing an internal structure of the L2SW 100, i.e., a line card 120 for analyzing header information of a frame to obtain transmission destination line information (about to which line of which line card the frame is to be output) and converting the frame into a switching cell to output the cell to a switch card 130 and for converting a cell received from the switch card 130 into a frame and sending the frame to a relevant line based on the transmission destination line information.

FIG. 2

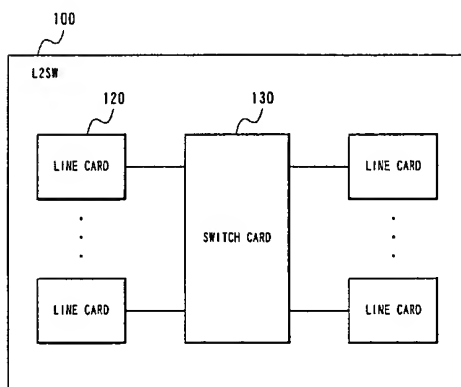
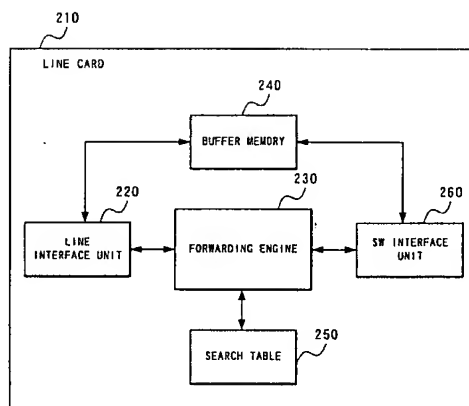


FIG. 3

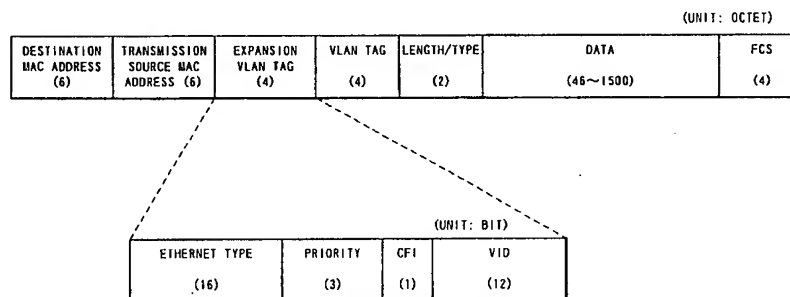


When a transmission destination line is in an area

different from that of a received frame, the line card 120 conducts processing of rewriting (swapping) information (Ether type, VID) of an expansion VLAN tag in the frame into information (Ether type, VID) of an expansion VLAN tag of the transmission destination area.

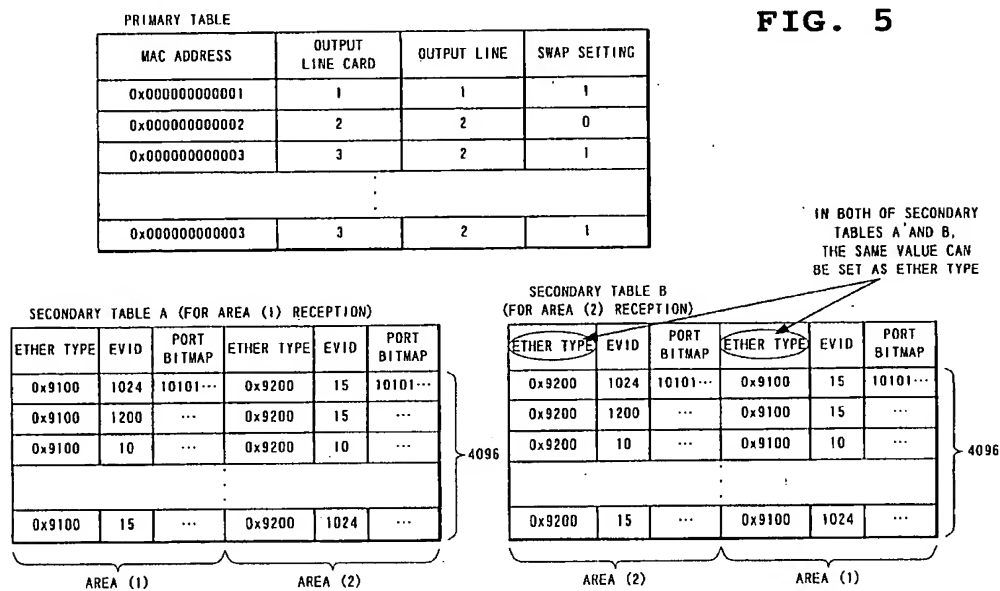
Figure 3 is a block diagram showing an internal structure of the line card 120, i.e., a line interface unit 220 for conducting frame reception processing, a forwarding engine 230 for conducting processing of determining a frame transmission destination and rewriting an expansion VLAN tag (Ether Type, VID), a frame buffer 240 for storing a frame, a search table 250 for storing table information and an SW interface unit 260 for conducting processing of interfacing the SW card 130. Format of the expansion VLAN tag frame is shown in Figure 4.

FIG. 4



Reference is next made to the disclosure beginning at the bottom of specification page 8. At the input of the L2SW 100 a frame is received at the line interface unit 220 of line card 120. The received frame is transferred to the forwarding engine

230. The forwarding engine 230 extracts header information from the received frame. Thereafter, the entire frame is stored in the buffer memory 240. Next, the forwarding engine 230 searches the extracted header information for a transmission destination line corresponding to a destination MAC address. Table information for the search of a transmission destination line is stored in the search table 250. See Figure 5.



A transmission destination line is specified by using a primary table. The table is composed of a MAC address, a line card corresponding to the MAC address, a line port and an identifier indicating whether the line port is a target of swapping or not. The SWAP identifier is used as an identifier for determining to which of one-to-one connected areas a line in question belongs (setting "0" identifier indicates the area (1) 200 and setting "1" identifier indicates the area (2) 300, for

example). With a transmission source MAC address as a search key, the area from which the received frame comes is determined by using the primary table. With SWAP identifier "0" set, the frame is determined to have been received from the area (1) 200, and the search for expansion VLAN tag information of the area (2) 300 is made using a secondary table A. With SWAP identifier "1" set, the frame is determined to have been received from the area (2) 300 and the search for expansion VLAN tag information of the area (1) is made by using a secondary table B.

Based on a search result, expansion VLAN tag information of an area corresponding to a transmission destination line is obtained to rewrite the expansion VLAN tag (Ether Type, VID). After the completion of the rewriting, the forwarding engine 230 writes the transmission destination line information etc. The SW interface unit 260 sets up the frame. After the set-up, the frame is transferred to the forwarding engine 230 which recognizes a transmission destination line from the in-device header to send the frame to the line.

A second embodiment of the present invention enables a plurality of areas to be connected to one area by changing search table arrangement, and is illustrated in Figure 6.

From the above, it is clear that the claims satisfy both §112, first and second paragraphs. One of skill would understand both the terms "transmission destination area" and "transmission source area" as the meanings of these terms is

clear from having read the specification. What constitutes the claimed unit is also clear. Thus, there can be no doubt that the specification enables one skilled in the art can make and/or use the invention.

Additionally, the claims are definite as they particularly point out and distinctly claim the subject matter which applicant regards as the invention.

A "transmission source area" is a first area network of a wide area network from which a frame is transmitted, and a "transmission destination area" is a second area network of the wide area network to which a frame is transmitted.

Accordingly, the statutory requirements have been satisfied by the present application and the rejections should be withdrawn.

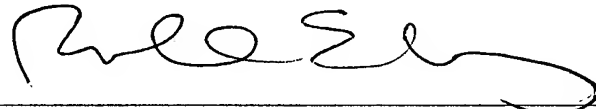
Applicants believe that the present application is in condition for allowance and an early indication of the same is respectfully requested.

Please charge the fee of \$50 for the addition of one claim of any type to Deposit Account No. 25-0120.

The Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 25-0120 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17.

Respectfully submitted,

YOUNG & THOMPSON



Roland E. Long, Jr., Reg. No. 41,949
745 South 23rd Street
Arlington, VA 22202
Telephone (703) 521-2297
Telefax (703) 685-0573
(703) 979-4709

REL/lrs

APPENDIX:

The Appendix includes the following item:

- replacement drawing sheet